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For : **POROUS CERAMIC BODY AND METHOD FOR ITS PRODUCTION**

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Amended patent claims (clean copy) - PCT Art. 19

1. Method for the production of a porous ceramic body, especially of a filter membrane, comprising the following steps:
A) Selection of a first ceramic powder (coarse grain) with a first grain size class,
B) Selection of a section ceramic powder (fine grain) with a second grain size class, which is far smaller than the first grain size class, wherein

α-SiC grains, are essentially exclusively used, aside from unavoidable contaminants, as ceramic grains for both the first and the second ceramic powder;
C) Mixing of the two ceramic powders to produce a powder with a bimodal grain size distribution and shaping of a molded body from the powder mixture as well as
D) Heating and conditioning of the molded body at a temperature and for a period of time such that, through recrystallization of the molded body, the grains with the second grain size are dissolved and, through attachment of the material of the second ceramic grains to the first ceramic grains, these are firmly linked to each other.
E) Layer-wide repetition of stages A) to D) with ceramic powders of different grain sizes, especially ever-decreasing mean grain sizes, such that a gradient with regard to the mean grain size is created transverse to the layers in the ceramic body.

2. Method of claim 1
characterized by the fact that
the grains of the first and/or second ceramic powders have a defined maximum and/or minimum grain size.

3. Method of claims 1 or 2
characterized by the fact that
in method step C), the ceramic powders are present in a slurry and shaping is effected by casting.

4. Method of any of the previous claims
characterized by the fact that
prior to method step D), a drying step occurs.

5. Method of any of the previous claims
characterized by the fact that
the mixing ratio between the first and second ceramic powder (coarse grain/fine grain) lies in the range 6:1 to 1:1, preferably 4:1 to 2:1.

6. Method of any of the previous claims
characterized by the fact that
the size ratio between the mean grain size or of the smallest grains of the first ceramic powder and the mean grain size of the largest grains of the second ceramic powder (coarse grain/fine grain) lies in the range 6:1 to 2:1, preferably 3:1.

7. Method of any of the previous claims
characterized by the fact that
batches of narrow grain size distribution are used for the first and second ceramic grains.

8. Method of any of the previous claims
characterized by the fact that
grain bands or grain mixtures having defined upper and lower grain size are used not only for the first ceramic grains, but also grain bands or grain mixtures having a defined upper grain limit are used for the second ceramic grains, with the size ratio between the finest grain fraction of the first ceramic grains and the largest grain fraction of the second ceramic grains chosen to be at least 2:1.

9. Method of any of the previous claims
characterized by the fact that
shaping of the molded body in method step C) proceeds on a substrate, especially in pore channels of a porous ceramic body of the same material.

10. Method of any of the previous claims

characterized by the fact that

the ceramic grains are of non-oxide ceramic and especially of the same type.

11. Method of any of the previous claims

characterized by the fact that

for a first layer, the grain sizes of the first ceramic powder are in the range 6.5 μm (FEPA 800) to 23 μm (FEPA 360), for a second layer in the range 1.5 μm (JIS 7000) to 6.5 μm (FEPA F800) and for a third layer in the range 0.5 μm (JIS 10000) to 2 μm (JIS 6000), with preferably JIS 6000 being used as the second ceramic powder for the first layer, JIS 9000 for the second layer, and JIS 20000 for the third layer, or in each case equivalent grain bands.

12. Method of any of the previous claims

characterized by the fact that

the temperature and firing duration in method stage D) is chosen such that hardly any grains of the second ceramic powder are present any longer in the microstructure of the finished ceramic body and at the same time the grain size remains as close as possible in the region of the initial grain size of the first ceramic powder and thereby giant grain growth is avoided.

13. Method of any of the previous claims

characterized by the fact that

grain sizes in the range 0.9 μm to 17 μm are used for the first ceramic powder and grain sizes in the range 0.2 μm to 3 μm are used for the second ceramic powder.

14. Porous ceramic body, especially made in accordance with a method of any of the previous claims, with an essentially homogeneous structure of interconnected, open pores and ceramic grains, with the ceramic grains essentially having a rounded shape and with both the ceramic grains and the pores essentially lying at least in defined

ranges in a narrow grain size or pore size range

characterized by the fact that

the defined ranges of narrow grain or pore size distribution are present as layers on a coarse-porous support or especially in pore channels of a coarse-porous support, and that the body consists, except for unavoidable contaminants, exclusively of recrystallized RSiC.

15. Ceramic body of any of claims 13 to 14

characterized by the fact that

the ceramic grains are present essentially in completely crystalline form.

16. Ceramic body of any of claims 11 to 15

characterized by the fact that

the ceramic body is essentially free of melt phase.

17. Ceramic body of any of claims 11 to 16

characterized by the fact that

the ceramic grains are of non-oxide ceramic and especially of the same type.

18. Ceramic body of any of claims 11 to 15

characterized by the fact that

it has adequate strength for use as filter membrane, especially in a cross-flow membrane filter.

19. Filter, especially cross-flow membrane filter, with a ceramic body of any of the previous product claims, especially an SiC membrane, on a coarse-porous support, especially SiC support, preferably made by any of the previous method claims.

20. Filter of claim 19

characterized by the fact that

it exhibits, with a double-layer membrane at 1 bar TMP in the test on water, a flow greater than 5, preferably 6, especially 8 m^3 per m^2 per bar per hour or, with a three-layer membrane, greater than 3, preferably 4, especially 6 m^3 per m^2 per bar per hour.

21. Filter of claim 19 or 20,

characterized by the fact that

the filter furthermore comprises a layer of porous oxide ceramic, especially for nanofiltration.